

③

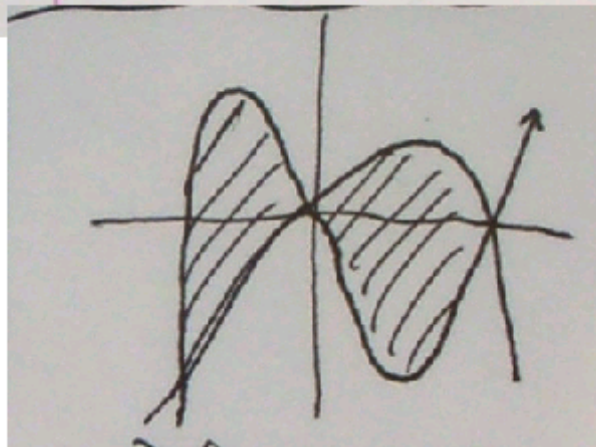
$$\begin{array}{r}
 0 \quad 3x^3 - x^2 - 10x - (-x^2 + 2x) \\
 -2 \quad 3x^3 - \cancel{x^2} - 10x + \cancel{x^2} - 2x \\
 \quad 3x^3 - 10x - 2x \\
 \quad \quad 3x^3 - 12x
 \end{array}$$

$x^3 - 8x$   
 $3x^4/4 - 6x^2$   
 $-8 - 24 = -32$   
 $12 - 24 = -12$   
 $\boxed{12}$

$$\begin{array}{r}
 2 \quad -x^2 + 2x - (3x^3 - x^2 - 10x) \\
 0 \quad -\cancel{x^2} + 2x - 3x^3 + \cancel{x^2} + 10x \\
 \quad -3x^3 + 2x + 10x \\
 \quad \quad -3x^3 + 12x
 \end{array}$$

$-x^3 + x^2 + 10x$   
 $-8 + 4 + 20 = 24 - 8 = 16$   
 $-3x^4/4 + 6x^2$   
 $-12 + 24 = 12$   
 $\boxed{12 + 12 = 24}$

$-3x^3 + 12x$   
 $? \leftarrow \begin{array}{l} 16 - 8 = 8 \\ 16 + 8 = 24 \end{array}$

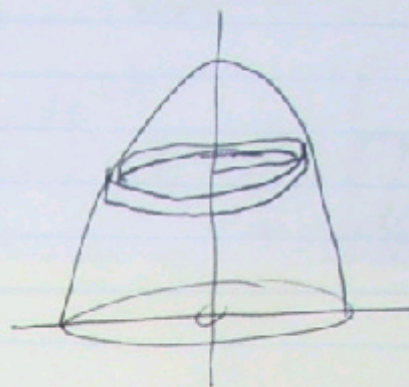
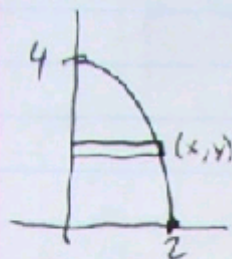




## Exposition 50

4/8/10

①



Vol. of slice

$$dV = \pi x^2 \cdot dy$$

$$\pi r^2 \cdot h$$

②

$$y = 4 - x^2$$

$$x = \sqrt{4 - y}$$

so

~~but not for this~~

$$dV = \pi (\sqrt{4 - y})^2 dy \rightarrow dV = \pi (4 - y) dy$$

③

$$\pi \int_0^4 (4 - y) dy \rightarrow \pi \left[ 4y - \frac{y^2}{2} \right]_0^4 \rightarrow \pi \left[ 16 - \frac{16}{2} - (0) \right]$$

$$\Rightarrow \frac{16\pi}{2} = 8\pi \text{ units}^3$$

④

Circumscribed cylinder

$$V = \pi r^2 \cdot h$$

$$V = \pi (2)^2 \cdot 4$$

$$\rightarrow 16\pi$$

$$8\pi = \frac{16\pi}{2}$$

⑤

Inscribed cone

$$V_{\text{cone}} = \frac{1}{3} \pi r^2 \cdot h$$

$$V_{\text{cone}} = \frac{1}{3} \pi (2)^2 \cdot 4$$

$$\Rightarrow \frac{16\pi}{3}$$

⑥

 $\frac{1}{2}$  cylinder



$$\pi(r_1^2 - r_2^2)$$

$$\pi(r_1^2 - r_2^2)$$

①

$$A = \left( (6e^{-0.1x})^2 - (\sqrt{x})^2 \right) \pi \rightarrow \textcircled{c}$$

$$A_{1.5} = \pi \left( (7.1)^2 - (0.4)^2 \right)$$

$$dV = \pi \left( (6e^{-0.1x})^2 - (x)^2 \right) dx$$

③

$$\pi \int_1^4 \left( (6e^{-0.1x})^2 - (x)^2 \right) dx$$

$$\begin{aligned} u &= -0.1x \\ du &= -0.1 dx \\ dx &= -\frac{1}{0.1} du \end{aligned}$$

$$-\frac{15\pi}{2} \int_1^4 (6e^u)^2 du$$

$$\pi \left[ \int_1^4 36e^{-0.2x} dx - \int_1^4 x^2 dx \right]$$

$$\pi \left[ \frac{15}{2} \int_1^4 36e^u du - \int_1^4 x^2 dx \right]$$

$$180e^u \Big|_1^4 - \frac{x^3}{3} \Big|_1^4$$

$$-90e^{-0.4} \Big|_1^4 - \frac{x^3}{3} \Big|_1^4$$

$$\left[ -90(e^{-0.4(4)} - e^{-0.4(1)}) \right] - \left[ \frac{4^3}{3} - \frac{1^3}{3} \right]$$

$$\pi \left[ -90(e^{-1.6} - e^{-0.4}) - \frac{15}{2} \right]$$

$$\frac{15}{2} (e^{-1.6} - e^{-0.4}) - \frac{15}{2}$$

$$\approx 108.88$$

$$\approx 108.885\pi$$



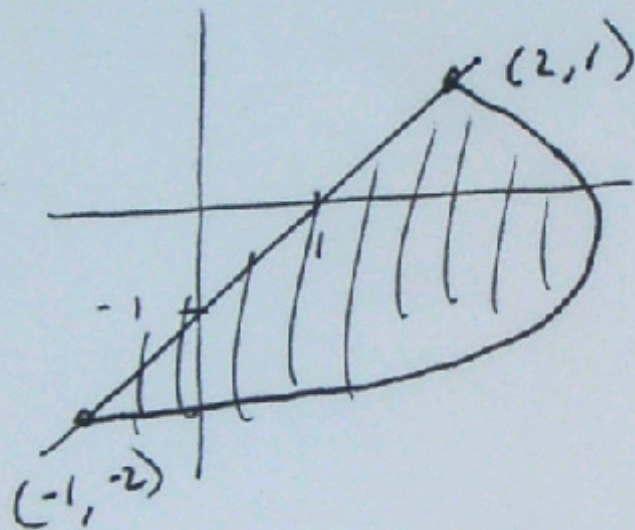


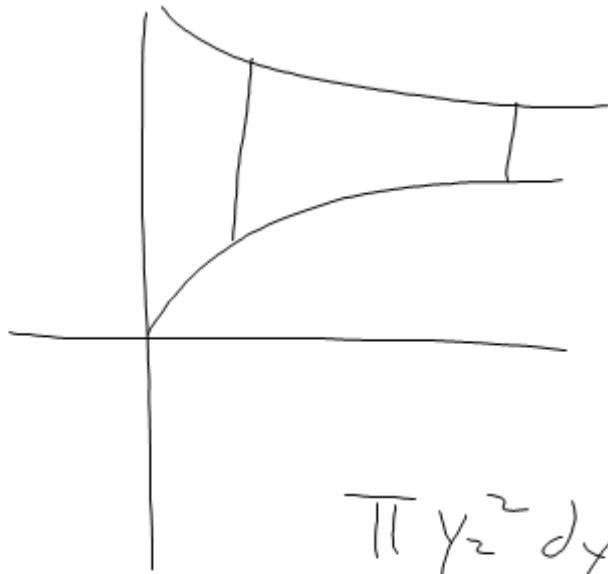
$$4) \begin{aligned} f(y) &= y+1 \\ f(y) &= 3-y^2 \end{aligned}$$

$$\int_{-2}^1 (3-y^2-(y+1)) dy = \left[ \frac{y^3}{3} - \frac{y^2}{2} + 2y \right]_{-2}^1$$

$$|-3.33| + 1.166 = \boxed{4.5}$$

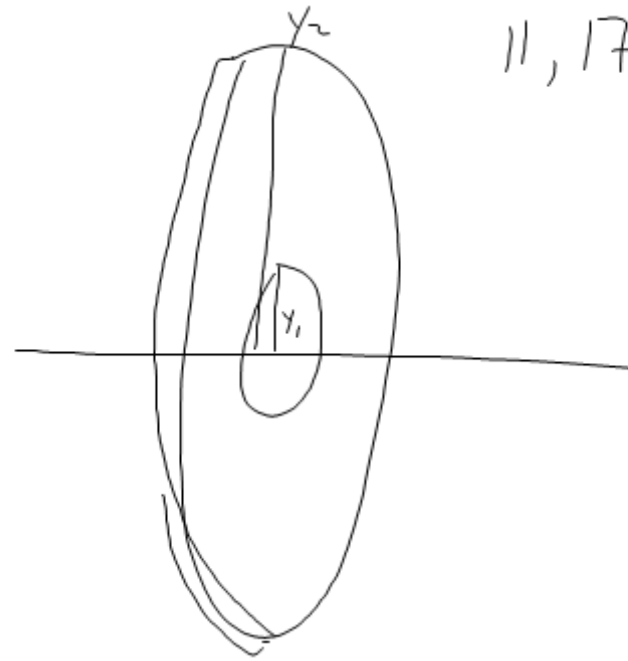
$$(4) \quad x = y+1 \quad x = 3-y^2$$





$$- \pi y_2^2 dy$$

$$\pi y_1^2 dy$$



7.3

#1, 4, 7-10(2),

11, 17, 18